

In the Claims:

Please amend Claims 1, 2, 27, and 38. A complete copy of the claims including marked-up versions of each claim which is amended in this Amendment D appears below.

1 1. (Currently Amended) A solid state laser gain medium having first and second ends
2 along a laser optical axis in which each end is profiled concave to provide a level of
3 thermal lens compensation at a desired operating pump power such that the beam has a
4 beam quality factor M² maximized at the desired operating pump power, wherein the
5 solid state laser gain medium is ~~operable~~ configured to operate in a laser oscillator cavity
6 that is optically symmetrical and includes flat cavity end reflectors.

1 2. (Currently Amended) A solid state laser gain medium as defined in Claim 1,
2 wherein the solid state laser gain medium is ~~operable~~ configured to operate in a laser
3 oscillator cavity arranged to incorporate a Q-switch or further gain modules.

1 3. (Previously Presented) A solid state laser gain medium as defined in Claim 1, in
2 which the solid state laser gain medium is formed of Nd:YAG.

1 4. (Previously Presented) A laser oscillator cavity including a solid state laser gain
2 medium as defined in Claim 1.

5. (Cancelled).

1 6. (Previously Presented) A laser oscillator cavity as defined in Claim 4, further
2 comprising:

3 a Q-switch having first and second acousto-optic cells in respective first and
4 second non-parallel polarization orientations, wherein at least one of said first and second
5 acousto-optic cells has a reflective end forming a cavity end reflector.

7. (Cancelled).

1 8. (Previously Presented) A laser oscillator cavity as defined in Claim 4, further
2 comprising:

3 a frequency converter; and
4 a frequency selective reflector between the solid state laser gain medium and the
5 frequency converter.

1 9. (Previously Presented) A laser including a solid state laser gain medium as defined
2 in Claim 1.

1 10. (Previously Presented) A laser as defined in Claim 9, further comprising:
2 a side-pumping diode element.

11-22. (Cancelled).

1 23. (Previously Presented) A laser ablation device comprising a laser as defined in
2 Claim 9.

24-25. (Cancelled).

1 26. (Previously Presented) A laser amplifier including a solid state laser gain medium
2 as defined in Claim 1, said laser amplifier further comprising:
3 a laser cavity; and
4 an amplifying module external to the laser cavity, said amplifying module sharing
5 a common axis of emission with said laser cavity and comprising an amplifier gain
6 medium having first and second ends along said axis of emission;
7 whereby at least one of said first or second ends of said amplifying module is profiled to
8 produce a lensing effect so as to directly couple light from said laser cavity into said
9 amplifying module.

1 27. (Currently Amended) A laser amplifier as defined in Claim 26, wherein one or
2 both of said first or second ends of said amplifying module are profiled to form an
3 amplifier lens having a predetermined focal length in order to maximize the beam quality

4 factor M² of the laser cavity at a desired pump power, and wherein the amplifier lens is
5 one of a refractive lens, a diffractive lens, or a GRIN lens.

28-30. (Cancelled).

1 31. (Previously Presented) A laser amplifier as defined in Claim 27, wherein said at
2 least one end of said solid state laser gain medium is profiled to form a first lens having a
3 focal length that is substantially equal to the focal length of said amplifier lens.

1 32. (Previously Presented) A laser amplifier as defined in Claim 26, whereby said
2 laser gain medium lens and said amplifier gain medium lens are concavely profiled.

1 33. (Previously Presented) A laser amplifier as defined in Claim 26, wherein said laser
2 gain medium and said amplifying gain medium are pumped simultaneously, and wherein
3 said laser gain medium pump and said amplifying pump have equal power.

34. (Cancelled).

1 35. (Previously Presented) A laser amplifier as defined in Claim 26, in which an input
2 surface to the amplifying module is tilted.

36. (Cancelled).

- 1 37. (Previously Presented) A laser amplifier having:
2 a laser cavity; and
3 an amplifying module external to the laser cavity, said amplifying module sharing
4 a common axis of emission with said laser cavity and comprising a laser gain medium
5 having first and second ends along said axis of emission;
6 whereby at least one of said first or second ends is profiled so as to directly couple light
7 from said laser cavity into said amplifying module;
8 wherein said laser gain medium and said amplifying medium are pumped simultaneously;
9 wherein in said module for an amplifier medium comprising a rod of diameter D_R , length
10 L_R , refractive index n_L , refractive index of air n_{air} , and thermal focal length f_{th} arranged
11 to receive an input beam from a laser having waist distance d_0 from the input rod end,
12 the rod is profiled with a radius of curvature R given approximately by
13
$$R = \frac{d_0(4f_{th} - L_R)(n_L - n_{air})}{n_L(4f_{th} - L_R - 2d_0)}.$$

- 1 38. (Currently Amended) A method of making a solid state laser gain medium having
2 first and second ends and further comprising flat cavity end reflectors along a laser

3 optical axis, said solid state laser gain medium being for use in an optically symmetrical
4 laser oscillator cavity arranged to produce a laser beam, said method comprising:
5 profiling concavely each end of the solid state laser gain medium to provide a
6 level of thermal lens compensation at a predetermined operating pump power in order to
7 maximize the beam quality factor M² of the beam at said desired operating pump power.

1 39. (Previously Presented) A method of designing a laser amplifier having a profile as
2 defined in Claim 37.

40-42. (Cancelled).

1 43. (Previously Presented) A laser assembly comprising a gain medium as defined in
2 Claim 1 and an amplifier as defined in Claim 26 coupled therewith.

1 44. (Previously Presented) A module as defined in Claim 33, in which, for an
2 amplifier medium comprising a rod of diameter D_R , length L_R , refractive index n_L ,
3 refractive index of air n_{air} , and thermal focal length f_{th} arranged to receive an input beam
4 from a laser gain medium having waist distance d_0 from the input rod end, the rod is
5 profiled with a radius of curvature R given approximately by $R = \frac{d_0(4f_{th} - L_R)(n_L - n_{air})}{n_L(4f_{th} - L_R - 2d_0)}$.